Creative Collaboration Leading to Technology Solutions – Agreement for Specialized Radiological Services – 26157

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ABSTRACT

The Formerly Utilized Sites Remedial Action Program (FUSRAP) was initiated in 1974 to identify, investigate, and, if necessary, clean up or control sites throughout the United States contaminated as a result of Manhattan Engineer District (MED) or early US Atomic Energy Commission (AEC) activities. Both MED and AEC were predecessors of the US Department of Energy (DOE). FUSRAP is jointly managed by the US Army Corps of Engineers (USACE) and the DOE Office of Legacy Management (LM). The joint federal agency team determines which sites are eligible, manages the historical records, identifies any cleanup requirements, performs remediation, and performs long-term stewardship related to qualifying sites. The associated authorities and responsibilities of each organization are outlined in a 1999 Memorandum of Understanding (MOU) signed by USACE and DOE.

Since 1998, USACE utilized several individual agreements with DOE's Argonne and Oak Ridge National Laboratories to access specialized radiological services not available in house to execute the FUSRAP cleanup work as directed by Congress. In 2020, USACE informed LM that its work would benefit from faster and wider access to DOE's world-class resources and the innovative radiological capabilities offered by all the National Laboratories and directorates under one contractual agreement with LM. In 2022, LM and USACE entered into an Agreement for Specialized Radiological Services to strengthen the nation's ability to manage government legacy radiological hazards at FUSRAP sites.

This agreement showcases how forward-thinking federal partnerships drive innovation, boost operational excellence, and protect both worker and public health and safety. Tangible results of this collaboration were quickly realized when the USACE St. Louis District capitalized on the agreement by engaging experts from the Savannah River National Laboratory (SRNL) to provide independent technical review of their investigative work at a property with high congressional visibility within the St. Louis Airport Site Vicinity Properties. SRNL conducted independent technical reviews of processes, including critical data collection, analysis, and design documents, and provided recommendations ensuring a high standard of integrity and reliability in project deliverables.

Another standout project resulting from the collaboration with SRNL is a Value Engineering (VE) evaluation for the phased design of the interim waste containment structure remediation at the Niagara Falls Storage Site in New York, which will address some of the nation's oldest and most complex legacy waste. SRNL was able to provide the expertise and lessons learned from the challenging cleanup work being done at the Hanford and Savannah River Sites.

The USACE Philadelphia District leveraged partnerships with the Pacific Northwest National Laboratory (PNNL) and the Lawrence Berkeley National Laboratory (LBNL) to resolve unique challenges at the former DuPont Chambers Works site in Deepwater, New Jersey. As a result, PNNL conducted critical research to identify unknown compounds in fugitive emissions. Separately, LBNL is assisting USACE in

developing advanced methods to quickly and accurately quantify in situ radioactive contaminants utilizing drone-mounted technology.

Different agencies, while aware of the benefits of utilizing the National Laboratory Network, had difficulties in connecting to the best laboratories for their respective issues. The Agreement for Specialized Radiological Services directly aided in forging new connections from one organization to another to ensure the best matches of laboratories to various FUSRAP sites. The agreement also expedited the process overall by eliminating the need to undergo a complex and lengthy contracting process. The Agreement for Specialized Radiological Services has showcased how interagency collaboration has led to efficient, effective, and impactful technical outcomes. This agreement is not simply procedural; it supports a shared mission among teams from different federal agencies who are dedicated to executing their programs to build a more resilient and safer future for the nation.

Although the agreement expires in 2027, USACE is transitioning to direct contracting mechanisms with select National Laboratories, further strengthening its operational and technical momentum. LM will remain invested in the continued success of this productive interagency effort and looks forward to watching its progress unfold. By rapidly harnessing the power of strategic alliances with world-class scientists with relevant experience, this initiative has helped drive meaningful progress in both worker and public safety and environmental stewardship.

INTRODUCTION

The US Department of Energy (DOE) formed the Office of Legacy Management (LM) in 2003 to provide a long-term, sustainable solution to the legacy of the Manhattan Project and the Cold War. LM is responsible for ensuring that DOE's postclosure responsibilities are met and providing programs for long-term stewardship (LTS), records management, workforce restructuring, employee benefits continuity, property management, land use planning, and community assistance. The sites that LM manages fall under a variety of regulatory and functional categories, one of which is the Formerly Utilized Sites Remedial Action Program (FUSRAP).

FUSRAP was established by the US Atomic Energy Commission (AEC) in 1974, under the derived authority of the Atomic Energy Act, to remediate sites where radioactive contamination remained from Manhattan Engineer District (MED) and early AEC operations. Later in 1974 and in early 1975, AEC was abolished, and its responsibilities were divided between the newly established US Nuclear Regulatory Commission, which assumed AEC's licensing and regulatory roles, and the US Energy Research and Development Administration (ERDA), which assumed other AEC responsibilities, including FUSRAP. By 1997, ERDA and its successor agency, DOE, identified, characterized, and remediated 25 sites under FUSRAP. Over time, AEC, ERDA, and DOE evaluated over 600 sites to determine their eligibility for inclusion under FUSRAP. Records of these evaluations were collected and are maintained in DOE's Considered Sites Database. This database is available on the internet for public information purposes.

In 1997, Congress transferred responsibility for the administration and execution of FUSRAP cleanups from DOE to the US Army Corp of Engineers (USACE). USACE, which has a long and successful history of managing remediation projects at former and current military installations, has been successfully executing FUSRAP remediation at many sites across the country. When executing FUSRAP, USACE follows the framework of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan.

Although USACE has remedial authority, FUSRAP remains a jointly managed program between both agencies. In 1999, DOE and USACE signed the MOU, along with letters of agreement, outlining both

agencies' roles in federally managing FUSRAP. Under the MOU, DOE retained the responsibility for determining the potential eligibility of new FUSRAP sites (based on historical records searches). After additional research and site characterization, USACE maintains final authority to determine if a site requires remediation under FUSRAP. USACE retains responsibility for any remediated sites for 2 years after cleanup before transferring the site to DOE for LTS.

HISTORY OF COLLABORATION

In addition to jointly managing FUSRAP, LM and USACE have a long-standing partnership of supporting each other's missions and have executed several interagency agreements (IAAs) to formalize technical support for the missions of both organizations.

Historical Collaboration Between USACE and the National Laboratory Network (NLN)

Since USACE received authority for FUSRAP remediation in 1997, National Laboratories have been providing support to USACE cleanup actions. Examples include Argonne National Laboratory providing specialized technical assistance for various FUSRAP sites, Oak Ridge National Laboratory providing nuclear criticality safety support to during previous remedial activities at the Shallow Land Disposal Area FUSRAP site, and Los Alamos National Laboratory providing beryllium health and safety support for the FUSRAP Luckey Site.

USACE Rapid Response Support of LM

In 2022, LM developed a contractual agreement with the USACE Rapid Response Technical Center of Expertise to support reconnaissance, assessment, and subsequent stopgap measures to mitigate release of contaminants, stabilize infrastructure, and minimize impact to human health and the environment in situations that could exceed LM's existing in-house capabilities under catastrophic conditions or remedy failure.

USACE National Memorandum of Agreement (MOA) Project Support of LM

In 2018, LM signed a National MOA with USACE that allows LM to supplement its support services contract by utilizing IAAs with USACE to receive commercial goods or services conveniently and cheaply. This agreement enables LM to better leverage nationwide assets available throughout the multiple USACE districts and offices to support, plan, and execute large-scale projects across LM's portfolio.

The first project taken on through the DOE-USACE National MOA, executed by the USACE St. Louis District, was the comprehensive design and construction of a new 2323-square meter (25,000-square foot) Interpretive Center and administrative building at the Weldon Spring, Missouri, Site, including the design and installation of new interpretive exhibits to communicate the site's historical importance. In addition, the USACE Albuquerque District is currently evaluating and scoping design alternatives for three Uranium Mill Tailings Radiation Control Act sites to address and prevent erosion and settlement associated with disposal cell covers and surrounding areas.

USACE Support of Greater DOE

In addition to the support USACE has provided to LM's mission, there are many other examples of collaboration across the DOE complex where USACE has supported multiple program offices, including construction and project execution for the National Nuclear Security Administration (NNSA) and cost estimating support and training for multiple program offices across DOE.

Network of National Laboratories for Environmental Management and Stewardship (NNLEMS)

In 2017, the DOE Office of Environmental Management (EM) established the NLN to advise DOE policy decision making at cleanup sites. This network consisted of the Savannah River, Idaho, Los Alamos, Oak Ridge, Pacific Northwest, and Sandia National Laboratories. Later in 2021, LM joined this network, which was also expanded to include the Argonne, Brookhaven, and Lawrence Berkeley National Laboratories; the National Energy Technology Laboratory; and the SLAC National Accelerator Laboratory. The group was chartered and renamed the NNLEMS. EM and LM headquarters and site offices work through an organized structure of laboratory contacts to identify and coordinate resources for addressing emergent technical issues, independent technical reviews, strategic planning, technical analysis to support policy development and stakeholder engagement, and collaboration with DOE contractors.

AGREEMENT FOR SPECIALIZED RADIOLOGICAL SERVICES

In 2021, USACE leadership approached LM about developing a charter or agreement that would provide USACE with ready access to the multiple National Laboratories' expertise and experience like the NNLEMS group. Following a period of discussions, research, and consultation about the possibility, the NLN Agreement for Specialized Radiological Services IAA was pursued. The agreement would be a streamlined contracting mechanism to support USACE by providing them with a simple route of working with any of the DOE's network of National Laboratories without the burden of having to have contractual agreements with each one.

The interagency agreement was formalized in 2022 between USACE and LM on an FS Form 7600A. This form is required for establishing the framework for how the partnership works. It identifies the general terms and conditions for the type of work scope needed under the IAA with LM or its partners at the National Laboratories. The form lays out the overarching guidelines of the agreement and the funding ceiling but does not include funding or direct specific project work. For each project, the work scope and funding are established on an FS Form 7600B which details the specific ordering requirements and funding information. The FS Form 7600B is prepared by USACE and defines the needed project scope from LM and the National Laboratories. LM utilizes the contents of the FS Form 7600B to develop a work authorization to formally request and procure the work from the selected laboratory. Once LM and the specified laboratory agree upon the scope and cost, the work authorization is signed by all parties, and funds can be obligated between agencies. While LM is not directly executing the work, LM plays an important role and remains engaged in the partnership to facilitate the work done by any given laboratory for USACE.

This unique agreement has allowed any of USACE's centers of expertise, districts, and divisions to request work from LM and DOE National Laboratories and directorates. The work performed under the agreement has resulted in several collaborations across FUSRAP Program sites.

SHOWCASED COLLABORATIONS UNDER THE AGREEMENT FOR SPECIALIZED RADIOLOGICAL SERVICES

The following examples illustrate how the combined laboratory experience and expertise from across the DOE complex, in conjunction with the deep, technical knowledge USACE has of the sites, have resulted in groundbreaking solutions through the NLN Agreement for Specialized Radiological Services IAA.

The USACE St. Louis District capitalized on the agreement by engaging experts from the Savannah River National Laboratory (SRNL) to provide independent technical review of their investigative work at a

property with high congressional visibility within the St. Louis Airport Site Vicinity Properties. SRNL conducted independent technical reviews of processes, including critical data collection, analysis, and design documents, and provided recommendations ensuring a high standard of integrity and reliability in project deliverables. This effort provided objective validation of the USACE sampling efforts and built trust with local stakeholders.

The USACE Buffalo District contracted with SRNL to utilize expertise to provide cost-effective, independent technical support of the development and review of plans, including a Value Engineering (VE) evaluation for the phased remedial design of the interim waste containment structure (IWCS) at the Niagara Falls Storage Site near Lewiston, New York. The IWCS was built in the mid-1980s to temporarily house some of the nation's oldest and most complex legacy waste. In 2019, USACE selected an alternative to remove the entire IWCS, process the contaminated materials, and ship the materials out of state for permanent disposal. The implementation of this plan presents unique challenges due to the specific nature of the waste contained in the IWCS. SRNL staff are providing vital chemical and process engineering support which capitalizes on lessons learned and successes from some of the other challenging waste treatment projects being executed by EM at the Hanford and Savannah River Sites. The USACE Buffalo District has applied the results from the VE evaluation and has revised the design to incorporate recommendations; the revision will result in better cost estimates for budgeting purposes and better cost realism when the IWCS remediation work is released for bid.

Finally, the USACE Philadelphia District has formed collaborative relationships with multiple National Laboratories to aid the cleanup work at the former DuPont Chambers Works FUSRAP site in Deepwater, New Jersey. Through the IAA, USACE has leveraged partnerships with the Pacific Northwest National Laboratory (PNNL) and the Lawrence Berkeley National Laboratory (LBNL). PNNL was tasked with executing research to identify and manage hazardous chemical vapors using advanced techniques. As a result, PNNL conducted critical research to identify unknown compounds in fugitive emissions. This testing resulted in deployed capabilities for field detection of tetraethyl lead, a non-FUSRAP contaminant historically produced by the site owner which presents health and safety issues for the USACE Philadelphia District when conducting fieldwork.

Ongoing efforts include a collaboration with USACE's contractors, Verina Consulting Group, LLC, and Ramboll©, on drone-mounted real-time vapor monitoring and sampling followed by evaluation of emissions with atmospheric dispersion modeling.

Also, at the DuPont Chambers Works site, experts from LBNL were brought onto a project to help develop advanced methods to quickly and accurately quantify in situ radioactive contaminants utilizing drone-mounted technology. Laboratory staff developed a prototype radiation mapping detector system specifically designed for mapping uranium contamination in excavations from an uncrewed aerial vehicle. The detector system was specifically designed to be suspended from the aircraft near to the ground to achieve the best spatial resolution and improve characterization. This suspended sensor array was referred to as the "chandelier" and is currently undergoing improvements and a second phase of testing. LBNL's work may lead to drone-mounted gamma radiation scanning of areas that pose risks to site workers performing manual scans.

Progress on both fronts has had direct, positive implications for worker health and safety and the overall project timeline. Furthermore, methodologies developed for the DuPont Chambers Works site project are being deployed and are furthering DOE capabilities across multiple program offices. For example, LBNL is using the chandelier sensor system and methodologies developed under the DuPont Chambers Works site project agreement to help identify critical minerals in mine waste for the DOE Office of Fossil Energy and Carbon Management. Other collaborative efforts between USACE and LBNL at the DuPont Chambers Works site have enabled LBNL to advance its state-of-the-art spectroscopic analyses, which is

now being applied on NNSA-funded research on nuclear safeguards and emergency management. LBNL envisions that this work may also benefit future EM and LM work.

CONCLUSION

In 2024, a new federal invoicing process, G-Invoicing, was enacted to improve transparency and communication between intergovernmental partners, standardize forms and data elements, and act as a document repository for IAAs and purchase orders. This new process eliminated some of the efficiencies gained by utilizing the three-party agreement. Because of this, the process for USACE districts to work directly with the DOE National Laboratories has been simplified. The districts are now working to set up contracting agreements with laboratories directly. However, use of the agreement has advanced the collaboration between USACE and the National Laboratories, and the efforts under the agreement will have impacts that will last many years into the future. While the current agreement ends in 2027, LM and USACE will look forward to continuing the collaboration with the NLN, under updated guidance with many lessons learned, and successful projects completed.

By providing readily available access to expertise across the National Laboratories, this agreement complemented and enhanced the capabilities available to USACE. The relationship encouraged USACE and the National Laboratories to build connections and strengthen relationships. Additionally, the agreement provided opportunities for laboratory scientists to have access to and gain a deeper understanding of new and complex problems through active USACE projects. Many of these collaborations have resulted in new ways to address environmental issues which are providing solutions to needs across DOE.